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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,281	12/09/2003	Jianbing Huang	05-03-014	4973

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EXAMINER

NGUYEN, KIMBINH T

ART UNIT	PAPER NUMBER
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2628

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/731,281	Applicant(s) HUANG ET AL.	
	Examiner Kimbinh T. Nguyen	Art Unit 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 May 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This action is responsive to amendment filed 05/26/06.
2. Claims 1-30 are pending in the application.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 4, 5, 8-12, 14, 15, 18-22, 24, 25 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korobkin (6,912,293) in view of Brokenshire et al. (6,624,810).

Claim 1, Korobkin discloses receiving node and view data (in a 3D graphics API such as OpenGL or direct 3D; col. 16, lines 63-65) for a graphic object (col. 17, lines 30-37); building a binary-space-partition tree corresponding to the graphic object (col. 15, lines 32-48), the binary-space-partition tree having up to a predetermined number of at least one shape associated with each leaf (col. 15, lines 64-67); sorting shapes at each leaf of the binary-space-partition tree (col. 15, lines 33-36); and outputting the sorted shapes (a subsequent traversal of the tree will deliver triangles (shapes) in a spatial correct "back-to-front"; col. 15, lines 37-38). Korobkin does not teach binary space partition tree having up to a predetermined number of at least one shape associated with each leaf; however, Brokenshire et al. teaches this feature (The plane A is the root of the tree and its two subplanes B and C are the children of node A; col. 6, line 1

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through col. 7, line 7). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Brokenshire into the BSP tree to accomplish a global visibility sort of the input database of Korobkin system, because once the space has been subdivided into a predetermined number of level of subspaces, the bounding volume of each space or subspace is recomputed such that the bounding volume just contains the object that fits into that level of the BSP tree (col. 7, lines 3-14).

Claim 2, Korobkin discloses the shapes are sorted into a substantially back-to-front order (col. 15, lines 34-38).

Claim 4, Korobkin discloses traversing the binary-space-partition tree (col. 15, lines 36-38; col. 31, lines 43-51).

Claim 5, Korobkin discloses the shapes are triangles (col. 15, line 37; figs 5a).

Claim 8, Korobkin discloses analyzing shapes (triangles) in a graphic object (fig. 15); creating a root node and a list of additional nodes for a binary-space-partition tree (col. 17, lines 56-62), each node associated with at least one shape (col. 19, lines 6-16); performing a partition plane selection for each additional node, classifying the shapes at the additional node according to the partition plane selection (col. 15, lines 51-63); and creating child nodes according to the shape classification (leaf nodes; col. 15, lines 64-66).

Claim 9, Korobkin discloses each node represents a set of elements located in a 3-D spatial region (col. 19, lines 45-51; figs. 9a, 9b).

Claim 10, the rationale provided in the rejection of claim 5 is incorporated herein.

Claims 11, 12, 14, 15, 18-20 the rationale provided in the rejection of claims 1, 2, 4, 5, 8-10 are incorporated herein.

Claims 21, 22, 24, 25 and 28-30 the rationale provided in the rejection of claims 1, 2, 4, 5, 8-10 are incorporated herein. In addition, Korobkin teaches a computer program product tangibly embodied in a machine-readable medium (col. 7, lines 6-50).

5. Claims 3, 6, 7, 13, 16, 17, 23, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Korobkin (6,912,293) in view of Brokenshire et al. (6,624,810) and further in view of Vlasic et al. US 2004/0114794.

Claims 3, 6 and 7, Korobkin does not teach caching the shape data; Vlasic et al. discloses caching the shape data (paragraphs 0050, 0055 and 0056); a configuration component is used (the graphic hardware 141), the configuration component balancing the resolution of the binary-space-partition tree against the sorting shapes at each leaf (paragraph 0074); a configuration component is used (graphics hardware), the configuration component balancing resource usage against accuracy in the resolution of the caching (the alpha blending is incorrect (paragraphs 0059, 0060). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the conventional graphics hardware, caching the projective texture coordinates of the shape data taught by Vlasic into the system constructing 3D scene of Korobkin to accomplish a global visibility sort of the input database, because it would provide high quality and high performance rendering (paragraph 0076).

Claims 13, 16, 17, the rationale provided in the rejection of claims 3, 6 and 7 are incorporated herein.

Claims 23, 26, 27, the rationale provided in the rejection of claims 3, 6, 7 and 21 are incorporated herein.

Response to Arguments

6. Applicant's arguments with respect to claim 1 has been considered but are moot in view of the new ground(s) of rejection.

The rejection of claim 1 has been modified according to the amendments and Brokernshire et al. teaches the limitation binary space partition tree having up to a predetermined number of at least one shape associated with each leaf (col. 6, line 1 through col. 7, line 7).

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

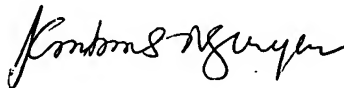
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7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kimbinh T. Nguyen whose telephone number is (571) 272-7644. The examiner can normally be reached on Monday to Thursday from 7:00 AM to 4:30 PM. The examiner can also be reached on alternate Friday from 7:00 AM to 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached at (571) 272-7664. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

August 7, 2006



KIMBINH T. NGUYEN
PRIMARY EXAMINER